Ttts

Tyee Mountain Member (middle and early Eocene)—1,500 to 1,800 m of rhythmically bedded, thick- to very thick-bedded to amalgamated, well-indurated, clay-cemented, light gray, micaceous lithic feldspathic sandstone (graywacke) and subordinate thin beds of deep-marine, dark gray mudstone (sandstone to mudstone ratio ranges from 5:1 to 30:1). Bouma abe and ae turbidite divisions common; with mudstone rip-ups, flute and groove marks, and load casts. Graded sandstone beds are medium- to fine-grained and generally structureless but display sharp bottom and gradational upper contacts. Very coarse flakes of muscovite and biotite are distinctive of this unit. Some thick slope channel amalgamated turbidite sandstones (20 to 75 m thick) with slumped beds and mudstone-chip conglomerates. Inner and middle submarine fan facies of Chan and Dott (1983) or proximal ramp facies of Heller and Dickinson (1985). Near base, thin- to medium-bedded outer fan turbidite sandstone with some thick laminated micaceous mudstone (Tttm). Mudstone-chip channel turbidite sandstones incised into underlying Camas Valley Formation in the southern part of the map, but turbidite unit thickens rapidly to the north and overlies basin plain facies turbidites of the Tenmile formation. Benthic foraminifers are referrable to the Ulatisian stage, and coccoliths are referrable to the CP-12 zone (middle and early Eocene; Bukry and Snavely, 1988; Ryu and others, 1992; Brouwers and others, 1995)

Tttm

Tyee Mountain Member mudstone (middle and early Eocene) —Thick, laminated micaceous mudstone

Umpqua Group (early Eocene and late Paleocene)—Consists of:

Tcv

Camas Valley Formation (early Eocene)—600 m of outer shelf and upper slope, medium dark gray, laminated mudstone; massive, micaceous; upper 100 m contain some calcareous concretions and shallow-marine mollusks. Unit forms broad gentle sloping valleys. Formation interfingers with and overlies undivided White Tail Ridge (Tw), mainly Coquille River member (Twrc) and locally unconformably overlies Tenmile Formation (Tm). Molluscan assemblages as well as benthic and planktonic foraminiferal assemblages indicate a late-early Eocene age (B-1 foraminiferal stage of Almgren and others, 1988) (Miles, 1977; Moore, 1991; McKeel, 1991, written communication in Ryu and others, 1992). Coccolith assemblages equate to CP-11 zone of Bukry and Snavely, 1988)

White Tail Ridge Formation (early Eocene)—Includes:

Tw

White Tail Ridge Formation, undivided (early Eocene)— 425 to 1425 m of moderately to well-indurated, ridge-forming hummocky bedded to bioturbated mollusk-bearing delta front-shoreline, fine- to medium-grained, thick- to thick-bedded lithic arkosic sandstone and thin subordinate gray mudstone; some paralic subbituminous coal beds, estuarine oyster-bearing sandstone, tidal flat accretionary bank mudstone, and thin mollusk-bearing siltstone; many coarsening- and thickening-upward parasequences in lower and upper part of the formation. In the middle part of the formation, moderately to well-indurated delta plain and fluvial, planar and large-scale trough cross-bedded, coarse- to very coarse-grained pebbly, channelized, lithic arkosic sandstone, some polymict boulder-cobble-pebble conglomerate (quartzite, chert, metamorphic, and intermediate to mafic volcanics), thick, massive, green, root-mottled overbank mudstone, and subbituminous coals. Some fining- and thinning-upward fluvial sequences. Formation is early Eocene (planktonic foraminiferal zone P10 McKeel, 1991, in Ryu and others, 1992, Penutian-lower Ulatisian benthonic foraminiferal stage; CP-11 coccolith stage, Bukry and Snavely, 1988; Ryu and others, 1992; Brouwers and others, 1995; D. Bukry, written communication, 1993)

Twrc

Rasler Creek tongue (early Eocene)—150 m of moderately to well-indurated, delta front or shoreline lithic arkosic sandstone; bioturbated to hummocky bedded; a few subbituminous coal and thin gray mudstone interbeds; thickening- and coarsening-upward parasequences; sandstone is fine- to medium-grained and moderately sorted. Unit occurs mainly as a conformable tongue that extends into and pinches out northward into mudstone of the Camas Valley Formation (unit Tcv). Unit grades laterally into thick Tw south of the map area. Tongue is lower Eocene (Ryu and others, 1992)

Twc

Coquille River Member (early Eocene)—300 m of moderately indurated and sorted, shell-bearing, fine- to medium-grained, bioturbated to hummocky bedded, lithic-arkosic delta front sandstone with thin subordinate gray mudstone interbeds; coarsening- and thickening-upward parasequences common; some lower delta plain, thick, massive, overbank carbonaceous mudstone interbeds, several subbituminous coal beds (0.5 to 2 m), and estuarine, oyster-bearing to shallow-marine bioturbated, mollusk-bearing fine- to medium-grained sandstone (Ryu and others, 1992). Member pinches out to the north and northeast. Basal contact of the member interfingers with underlying Remote Member and locally overlies massive slope and outer shelf mudstone of the Tenmile Formation (unit Tm)

Twr

Remote Member (early Eocene)—650 m of ridge-forming, multiple fining and thinning upward sequences (6 to 60 m thick) of coarse- to very coarse-grained pebbly quartzose-lithic-arkosic fluvial (meandering river) to delta plain sandstone, subordinate thick, root-mottled, overbank deposits; massive light gray-green mudstone, dark gray carbonaceous siltstone, and thin coals (Kugler, 1979). Poorly sorted sandstone beds in lower part of member are channelized, lenticular, contain lenses of pebbles in large-scale planar to trough cross-beds with some overlying ripple- and parallel-laminated thinner sandstone which contains carbonized tree limbs and molds of logs. In the southern part of the map area and in the adjacent 1:100,000 sheet, unit is very thick pebble-cobble-boulder polymict fluvial conglomerate suggestive of a braided stream deposit (Ryu and others, 1992). Minor delta front interbeds of bioturbated shelf shallow-marine sandstone that contain fossil mollusks, including Venericardia and Turritella. Pebbles are rounded to sub-rounded and consist of multicolored chert, graywacke, quartzite, mafic and intermediate volcanic rocks, mudstone rip-ups, and fine pebble chert-quartz conglomerate derived from Mesozoic Klamath Mountains terranes (Koler, 1979; Kugler, 1979; Ryberg, 1984). The thick pebble-cobble-boulder conglomerate incised valley fill in lower part of member is organized imbricated and disorganized matrix-supported debris flow-braided stream deposits that rapidly thin and pinch out northward into typical Remote Member delta plain-meandering river sandstone, mudstone, and coal. The incised valley fill overlies a local erosional unconformity cut into the underlying shallow-marine Berry Creek Member (unit Twbc; Ryu and others, 1992); locally divided into:

Twrm

Mudstone (early Eocene)—Subordinate thick, root-mottled, overbank massive light gray-green mudstone, dark gray carbonaceous siltstone, and thin coals (Kugler, 1979)

Twbc

Berry Creek Member (early Eocene)—More than 150 m of well-indurated delta front, hummocky to cross-bedded and bioturbated, mollusk-bearing, pebbly lithic arkosic sandstone with minor mudstone and thin polymict congomerate beds; many thickening-upward delta front parasequences. Sandstone is fine- to medium-grained, medium gray (fresh) to yellow-brown (weathered) and thick- to very thick-bedded or amalgamated. Pebbles are chert, quartz, metamorphic, and intermediate to mafic volcanic. Member conformably interfingers with underlying mudstone of Tenmile Formation. Molluscan fauna and coccolith flora indicate an early Eocene age (coccolith biozone CP-11; D. Bukry, written commmunication, 1994; Brouwers and others, 1995; Moore, 1991, in Ryu and others, 1992)

Twst

Unnamed siltstone member (early Eocene)—Massive to thin-bedded marine mudstone underlying sandstone of Whitetail Ridge in southwest corner of quadrangle; unconformable on folded turbidites of Tenmile Formation; inferred to be deeper marine facies of Whitetail Ridge Formation

Tenmile Formation (early Eocene)—Includes:

Tm

Tenmile Formation, undivided (early Eocene)—Up to 1,000 m of massive to well-bedded, very thick sequences of deep-marine, well-indurated, dark medium gray, rhythmically bedded, thin, graded, medium- to very coarse-grained lithic turbidites (Bouma abcd and bcd divisions common) and thin dark gray mudstone interstratified with thick bathyal foraminifera-bearing, upper to lower slope and basinal, dark gray laminated to massive mudstone; minor medium- to thick-bedded, very coarse-grained, lithic turbidites; some thick lenses and channels of massive, pebbly lithic sandstone to disorganized and organized polymict pebble-cobble conglomerate. Thin mollusk-bearing, upper slope-outer shelf mudstone in upper part of unit (Ryu and others, 1992). Tenmile Formation strata conformably overlie Bushnell Rock Formation. Foraminiferal and coccolith assemblages indicate formation is early Eocene (Penutian foraminiferal stage; Thoms, 1965; Miles, 1977; and CP10 and 11 coccolith stages; D. Bukry, written communications, 1991-96; Brouwers and others, 1995). Lower part of the unit equates to foraminiferal stages C and B-4 to B-1 of Laiming (as described by Almgren and others, 1988; McKeel, 1991 in Ryu and others, 1992)

Tmsl

Slope mudstone (early Eocene)—Dark gray slope mudstone with medium gray, thin-bedded lithic turbidite sandstone filling cross-cutting nested channels; lenticular sandstone beds, slumped and prolapsed bedding, flame and load structures. Some massive upper slope-outer shelf, massive, dark gray, mollusk-bearing mudstone in upper part; unit overlies basin plain unit Tmm in north-central part of map area

Tmsm

Turbidite sandstone and mudstone (early Eocene)—Thin- to medium-bedded(?), lenticular lithic sandstone and dark gray mudstone; grades lateraly into unit Tmcs submarine turbidite channel deposits; possible inner fan levee deposit

△	DATE	REVISION	BY

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